whole may have little or no meaning to him. There is a strong tendency to automatism with operators. Mr. S., a dispatcher, works daily with forty or fifty men, and states that after hearing four or five words he can readily recognize the sender or be sure that he is not one of his men. Many dispatchers claim that they can readily recognize a woman by her style of sending. The best time to learn telegraphy is eighteen years of age, and the maximum skill may be maintained until sixty-five years of age. Every operator shows personal peculiarities in his form of sending a message—by inflexions in experts, which increase in variations in proportion to expertness. At first the sending rate exceeds the receiving rate, but finally the receiving rate exceeds the sending rate as experience increases.

The operator hearing his own writing does not improve his power to receive in anything like the same degree that the hearing of other operator's writing does. Learners enjoy the practice of sending, but feel practice in receiving to be painful and fatiguing drudgery. As a rule, ordinary operators will not make the painful effort necessary to become experts. For many weeks there is an improvement which the student can feel sure of and which is proved by objective tests. Then follows a long period when the student can feel no improvement and when objective tests feel little or none. At the last end of this plateau, the messages on the main line are, according to the unanimous testimony of all who have experience in the matter, a senseless chatter to the student—practically as unintelligible as the same messages were months before. Suddenly, within a few days, the change comes, and the senseless chatter becomes intelligible speech. CHRISTISON.

THE MENTAL DEVELOPMENT OF A CHILD. By Cathleen Carter Moore (Psychological Review, Oct., 1896).

Mrs. Moore narrates and discusses the development of her child (a boy), during the first two years of its life, in a manner both precise and intelligent, and occupies 150 pages of a special issue of the Review with her subject. Nothing of the heredity or physical form of the child are mentioned. The following are the most noteworthy points given by her as she classified them. The observations of the first tour were made by her husband.

Habits.—Within one hour from birth it sucked its thumb. It did the same at the end of its second year. After the first day it sucked its hands also, especially after long intervals, up to the eleventh week, after which it more or less sucked its thumb. Spontaneous movements often jerked its hand from its mouth up to the eleventh week when the jerks ceased. His aim for his mouth was very uncertain up to the eleventh week.

Hands and Arms.—During the first five days fingers were flexed in fists, and he slapped objects presented. Sixth day, fingers became frequently extended, but held near face. Twenty-ninth day, he would try to carry a presented finger to his mouth. Thirty-sixth day, he would grasp and hold clothing and carry a hand towards his face. Fifty-fith day, he grasped at everything he came in contact with. Tenth week, he fingered things a great deal. Twelfth week, in his first attempt at reaching he fixed his gaze on the object, pursed his lips in attention and moved his hand graspingly towards it. Fifteenth week, hand uncertain and shaking in reaching. Seventeenth week, played with his own finger; did not try to get things beyond his reach, except by moving his body towards them. Twenty-first week, his feet became a favored plaything, and by the twenty-fifth week he objected to having them recovered. Twenty-sixth week, feet began to supplement the hands in feeling at objects. Twenty-seventh week, attempted to hold with his feet. Thirtieth week, drummed on the table of his chair with a spoon or gum-ring. Thirty-second week, tried to grasp a fly with his whole hand. Thirty-third week, attended to two things at once—mouth his ring and grap another object. He now quit playing with his feet, but used them for reaching and feeling. Thirty-fourth week, used his fingers separately. Thirty-sixth week, in reaching he used objects at hand. Thirty-eighth week, began to imitate with hands. Thirty-ninth week, used forefingers in feeling objects. Forty-fourth week, began to pick up objects with forefinger and thumb. Eighty-eighth week, forefinger used in pointing out objects. One hundred and fifth week, gave evidence of being right-handed.

Volition.—Fourth day, kissed when hungry, he turned his open mouth in direction of kiss. Seventeenth day, turned towards breast when hungry. Thirty-eighth day, gazed at visitor, and his body quivered by exertion. Twelfth week, tries to raise his body to a sitting posture. Seventeenth week, holds his head erect and tries to turn his body over. Twenty-sixth week, opens his mouth at the approach of a spoonful of water. Thirty-third week, recognizes things by resemblance. Thirty-fourth week, begins to discriminate and show preference. Thirty-eighth week, conscious imitation. Fortieth week, began to assist himself to stand. Forty-first week, drew objects to him instead of pushing them away. Forty-second week, repeats syllables and words. Forty-sixth week, creeping a habit; hunts for a person, lead by sound. Fifty-eighth week, acts previously forbidden by mother he would slyly do when she was not looking. Sixty-first week, walks alone. Seventy-third week, recognizes danger and recedes from it. Seventy-fifth week, shows obedience and previous discipline but displeasure at exactions by picking up two pins and bringing them to his mother, who, as always, takes them from him, and he is thereby displeased. Eightieth week, tries to give his doll a drink. Eighty-second week, conjoins after breaking. Ninetieth week, imitations more complex and frequent, and contrary actions increasing until twenty-fourth month as language becomes better understood One hundred and first week, told purpose before acting. One hundred and fourth week, influence of association more manifest.

Inhibitory movements.—Third day, stopped crying by loud noise. Nineteenth week, would correct his motions. Thirty-ninth week, one good fall stops his farther kicking in the same way. Eighteenth month, would often cease to try when told to do so. Twenty-third month, when told to refrain, he would do so if not too long exposed to temptation.

Automatic Movements.—They were frequent during sleep, night and day, until the sixth week, when they gradually almost entirely ceased. Twenty-third week, a noice which heard once before awakened him, now only evoked a cry in his sleep without opening his eyes. Twenty-fifth week, could readily find the breast and suckle while asleep.

Emotion.—First day, cried at discomfort. Sixth day, smiled at comfort. Seventh day, smiled at father four consecutive times and simultaneously moved its arms. Tenth day, tears observed. Seventeenth day, fretting cry in discomfort. Forty-sixth day, laughed. Sixty-first day, pursing lips with attention. Tenth week, rapid motion of limbs in excitement. Twelfth week, urine observed to be longer retained under exciting or normal experiences (six hours at longest). Ninth month, excitement interfered with evacuation of fæces also. Nineteenth week, writhing and twisting body expressed delight. Twenty-fourth week, kicking, laughter and screaming expressed pleasure. Twenty-fifth week, fretting and scolding at disappointments and vigorous movements of legs and body in proportion to excitement or strength of feeling. Thirtieth week, frowned when annoyed, movements rhythmical. Thirty-third week, smile changes and becomes more expressive. Forty-third week, delight expressed by piercing scream and active movement of limb. Forty-sixth week, delight expressed by shiver, noticed only for six weeks more. Fifty-fifth week, mischievous look. Seventy-eighth week, shyness by hiding head; squarely open mouth in crying becomes more frequent. Eighty-seventh week, struggled and hit when opposed; this lasted only a few weeks. End of second year, pleasure expressed by stamping, trembling hands, sparkling eyes, and running around and around.

Notes.—Muscles of face more quiet in a profound sleep than in a light sleep. First smiles were produced by muscles around the mouth and not perceptibly around the eyes. They were extremely evanescent and occurred on peacefully dropping to sleep; occasionally at persons. Finally the whole face, including the scalp, united in producing a smile. Smiles never occurred when the child was known to be in pain. At birth there were well-defined movements expressive of pain, but none for pleasure until the dawning of intelligence. For displeasure there were few modifications, but for pleasure there were many in the course of development.

Reflex Movements.—These were not observed systematically. They were seen the first day. All gradually ceased to respond to their stimuli, except such as were instinctive, or modifications, or additions to instinctive movements—direct accommodations to environment; and those that were instinctive plus spontaneous movements.

Sight.—First day, eyes opened by only a narrow crack; balls constantly rolling open or shut; pupils hardly affected by strong light. Second day, looked intently at a bright object and followed its movement. Third day, eyes wide open but not in focus; turned from one object to another. Eighth day, eyes first seen in focus; looked at surroundings for half an hour. Tenth day, eyes often in focus, followed objects moving to and fro. Forty-seventh day, looked with interest at things. Sixtieth day, looked at strange faces seriously, but smiled at those familiar. Twelfth week, would remain quiet an hour watching trees sway in the wind. Fiftieth week, made grimaces at his own reflection in a mirror and ceased when he saw by reflection that he was observed. Fifty-eighth week, recognized a person he had seen but once for a few moments three days before, but by whom he had been hurt. One hundredth week, he never showed any preference for colored pictures over uncolored pictures.

Hearing.—Second day, first definite reaction to sound—it several times stopped crying when its father began to whistle. During the first common sounds were comparatively ineffective. Fourth day, frequently looked at father when spoken to by him. Seventh day, looked intently when spoken to. Seventeenth day, peculiarly sensitive to sounds—was restless and apparently not well. Twentieth day, lay still for fifteen minutes when some one was singing to him. Thirtieth day, turned his head in the direction whence sounds proceeded. Seventeenth week, evinced pleasure in an action song. Twenty-first week, the slightest sounds seemed to interrupt his meals; he looked in their direction. Twenty-sixth week, voices which formerly startled him and made him cry, now only create curiosity. Twenty-seventh week, location of sounds fairly well established, except those from behind his head. Thirty-eighth week, he drummed continuously with some hard object on the table of his chair. Forty-first week, began to distinguish among spoken words. Fifty-fifth week, he understood a little language and possessed some words of his own. Ninety-eighth week, he could refer all the noises of the house to their sources.

Touch.—Sixth day, begins to use palm of hand by pressing it against his mother's breast while sucking. To be soiled or wet causes him to cry. Eleventh week, begins to feel objects. Sixteenth week, plays with his own fingers. Twentieth week, sometimes uses his feet to feel with. Twenty-fourth week, objects to covering on his feet. Twenty-seventh week, feels objects with hands and feet, and then puts them to his lips. Flies waken him if they walk on his face. Thirty-ninth week, forefinger tip used to feel small objects. Fifty-second week, localizes pain well—puts hand on the hurt.

Mental Development.—Involuntary attention established immediately after birth. Some representations were established by the ninth month, but not until the second year were fairly distinct images possessed. During the second year associations were gradually formed connecting mental image with mental image, but prior to this there was no faculty of voluntary recall. Associations of similarity began to occur about the fortieth week. Associations of simple contiguity predominated at all times. In the ninety-eighth week every act of the child, during the greater part of a day, was found to be connected with such association. The suggestion of object by object was not a common occurrence before the seventy-first week. His perception of likeness was not the reverse side of the perception of difference. Reconstructions independent of original contiguity began to occur about the close of the second year. He had some class ideas but no abstract ideas pertaining to his concrete words.

Late in the second year language became a channel for the conveyance of thought, but when a representation had been evolved, it was concrete and limited. Generalization and induction as well as inference occurred. An embryonic induction was thought to occur when the child refused to reach for an object whose distance from him was greater than the length of his arm. The higher forms of thought were developed with the more complicated movements and existed in embryo before abstraction was to any extent possible, and inference, induction, generalization and reconstruction were mental habits in the same sense that sitting, creeping, etc., were habits, and that each mental habit was developed by a method similar to that found in the development of a bodily habit.

Language.—First sound, the expiratory *a* in crying. After the eighteenth week the variation in tones slowly disappeared, and the voice gradually settled into a clear falsetto. Twelfth week, he began to use his tongue and had made about all the sounds of the language. Thirty-sixth week, he acquired the habit of repeating a sound of his own upon hearing it uttered by another person. Thirty-eighth week, he began to associate a few words with persons and objects. Forty-second week, conscious but unintelligent imitation became habitual. Sixty-fourth week, the first verb (gone) made its appearance. Sixty-sixth week, the first sentence was uttered (papa gone). Ninetieth week, the first action: word proper came into use (sit down). At the end of the second year the child had acquired 475 words as follows, viz.: Nouns, 306; verbs, 92; adjectives, 38; adverbs, 14; pronouns, 11, and of prepositions, interjections and conjunctions, 14 in all.

In the early days of language development, each word whose faulty pronounciation had been laboriously acquired replaced for a time the old words which for several days were scarcely heard. The application of a word was extended slowly and by degrees. At the close of the second year the child invariably asked the name of a new object.

CHRISTISON.